

# POPULAR Computing WEEKLY

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20-26 March 1985

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Vol 5 No 12

## SPECIAL FEATURE ISSUE Graphics . . .



The Art Studio on a Spectrum

*... software starts  
page 11*

*... hardware starts  
page 14*



Wiggins House's Megacomputer



Deluxe Paint on the Amiga

*... the future  
page 8*

## Amstrad's PC – more details

MORE details are beginning to emerge about Amstrad's forthcoming IBM-PC compatible, widely tipped as the next new colour from the Amstrad stable, and representing a significant move by Amstrad into the business market.

It appears that Amstrad is looking at two versions of the machine – one with at least one 5 $\frac{1}{4}$  inch disc unit, the second with a hard disc included. A suggested price for the first model is £699, for the second, under £800. Both models are expected to be sold with a colour monitor.

Amstrad has also been working to offer substantially improved graphics capabilities than IBM's own PC machines feature. It is thought that Amstrad is closely working with a major graphics development company to produce a built-in graphics board with the machine.

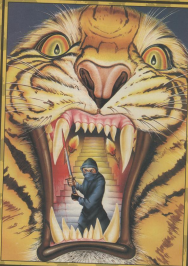
Amstrad PC motherboards are currently being tested to ensure their complete software and board compatibility with the IBM standard, but Amstrad is not expected to announce the machine until the late summer.

## GRAPHICS COMPETITION

*Touchmaster  
graphics  
tablets –  
five to be  
won – p6*



# THE WAY OF THE TIGER



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**TRIPLE-SCROLL**  
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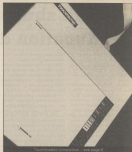
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## EDITORIAL

**T**he decline of Acorn computers from one of Britain's highly regarded manufacturers to a supplier of specialist machines to specialist markets has been well noted.

And, because the tremendous success of the BBC is in the educational sector should have been a launch pad for success in other market sectors - a compatible version for the home, for example, which the Electron never quite achieved, or a similar 16-bit model for business use, to attract all those ex-BBC school leavers looking for BBC technology.

Instead it appears to have become an end in itself.

Acorn's problems in utilising the BBC's technology to sell its quality in a variety of market sectors and then finance its research schemes culminated in the takeover by Olivetti last year. One of Acorn's major setbacks had always been its failure to attract a large export market for the heavy into the US, for example, was disastrous. And exports are highly important.

More than half of Acorn's turnover is expected to come from overseas this year and should contribute to recent profits. Acorn's success in Spain enabled it to share the cost of bringing out the 128 (both there and in the UK).

One of the strong points of the Olivetti deal was the potential for strengthening Acorn's export performance. The opportunity is there with Olivetti's current drive into the Italian educational arena, which requires an MS-DOS machine.

New Acorn schools that in MS-DOS compatible Master 512 is 'not ideally suitable'. The strong link from Acorn is that it is looking for a machine that will be 'suitable'. Acorn also says that its RISC technology development will, when completed, solve many of these problems.

But Acorn has stated the RISC research will take around two years to come to fruition.

It looks as though the opportunity has been missed.

Editor: Christine Graham. Features editor: Graham Taylor. Software editor: John Cook. Production editor: Louise. Circulation/Advertising manager: Claire. General Advertising enquiries: David. General Circulation enquiries: John. Subscriptions enquiries: John. Managing editor: Peter. Marketing enquiries: John. Published by ABC Publications Ltd, 11-13 Little Newport Street, London WC2R 3PP. Tel: 01-493 1440 Telex: 940225. Copyright Publishers (International) Bureau Ltd. 1 King's Cross Road, London WC1. Printed by Arrowway Services, Stone Road, London SW16. Acorn, Acornware, and RISC are trademarks of Acorn Computers Ltd. ABC Publications Ltd 1986.

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Computer Trade Association Magazine of the Year

**ABC**

# Olivetti shuns Acorn in education drive

ACORN has been dealt a blow by its parent company Olivetti, regarding the Italian firm's plans to supply the European educational computer market.

When Olivetti stated its plans to secure 100% of the deal was that Olivetti would promote Acorn's educational machines in the European market. Now Olivetti is looking to its US partner AT&T to launch Olivetti's IBM MS-DOS micro, just two months after the launch of Acorn's Master series, which includes the MS-

DOS compatible Master 310, which runs DOS Plus.

Senior Olivetti staff have been quoted as saying that Acorn's hardware base is "a real problem," although conceding that it has a "valuable software library."

"Overseen promotion is still part of the package," said an Acorn spokeswoman. "The two companies are married. If you like, and we are working out how to act together and best attack the market - but it doesn't happen overnight."

"In Italy the government

has decreed that MS-DOS is the educational standard, which means that in the short term our products are not ideally suitable. The Master 310 is in part suitable but it doesn't go the whole way. This will not be the case in the medium term. We are looking for machines which are capable of meeting the needs of various markets."

■ Hermann Hansen, co-founder of Acorn, has now been promoted to Olivetti's main board as director of advanced research and development.

## Sinclair confirms portable will now be launched next year

FOLLOWING Sir Clive Sinclair's announcement that the Pandion, Spectrum-compatible portable micro would be launched this autumn (see *Popular Computing Weekly*, February 26), the official Sinclair line is now that it will not be available until 1990.

"Some early production models may be available this year. We will be trying out these models in a number of defined market areas, but the machine will be launched in 1990," said a Sinclair spokesman.

One of Pandion's features said to be decided is its disk storage system. Sinclair has been looking at the possibility of implementing "credit-card" style software, possibly Smart cards, for the additional software. A certain amount of software will be built-in to the machine.

But the spokesman did not rule out the question of floppy disk storage, which would be more viable if Sinclair wants to attract conversions of CP/M software to the machine.

"We have been looking into the card question," the spokesman continued, "but there has been no firm confirmation of that."

It looks as though Sinclair is still aiming for a price for Pandion of around £200, although no exact amount has yet been fixed.

## 'Hackers' trial set for April 14

THE two men accused of "hacking" into the French database, Robert Schifano and Steven Gold, are due to stand trial at Southwark Crown Court, on April 14 under the Forgery and Counterfeiting Act, 1981. This comes after a number of preliminary hearings at Bow Street Magistrates Court.

## BT warns against Prestel tricksters

BRITISH Telecom is warning its Prestel subscribers against confidence tricksters. The latest method being used to obtain users' security codes is deceptively simple. One person calling particular numbers is telephoning customers posing as a Prestel official, and asking for passwords and identification codes. Once obtained, he can then charge his own Prestel dues to these other accounts.

BT has sent a letter to customers warning them not to release confidential information regarding passwords.

## Exploding Fist tops Gallup 1985 charts

GALLUP, which compiles the weekly charts for *Popular Computing Weekly*, has announced its "best of 1985" chart.

Top-seller over all machine formats last year was *Way of the Exploding Fist* from Melbourne House. *Fist* was also the Amstrad number one in 1985. On the Spectrum and Commodore machines top slot went to the *Realist Aid* charity tape *JetMail*, with *Fist* second on both formats. *Elite* (Amstrad) was the number

one seller on the BBC, and *Mercurius* (Hewlett) on the Atari.

This is the 1985 Top ten over all machines: 1. *Exploding Fist*; 2. *Soldier*; 3. *Elite* (Amstrad/Amstrad); 4. *JetMail* (Amstrad); 5. *Elite* (Spectrum); 6. *Mercurius* (Hewlett); 7. *Realist Aid* (Amstrad); 8. *JetMail* (Spectrum); 9. *Elite* (Spectrum); 10. *JetMail* (Spectrum).



*Fist* last year's number one

11. *JetMail* (Spectrum); 12. *JetMail* (Spectrum); 13. *JetMail* (Spectrum); 14. *JetMail* (Spectrum); 15. *JetMail* (Spectrum); 16. *JetMail* (Spectrum); 17. *JetMail* (Spectrum); 18. *JetMail* (Spectrum); 19. *JetMail* (Spectrum); 20. *JetMail* (Spectrum).

## 8256 launched in America

AMSTRAD'S PCW 8256 should be available in North America through the year-end sale. Based on the end of the month (see *Popular Computing Weekly*, December 26/January 2).

The deal with Sears means

that each Sears store (and there is one in nearly every town in the US and Canada) will be selling the 8256 with staff trained to answer queries on the machine. It will be priced at \$299 (just over £100).



## Amstrad show

THE first Northern Amstrad Computer Show takes place this weekend (March 22-23), at New Century Hall, Corporation Street, Manchester. Organiser Database Publications expects over 60 new products to be launched at the exhibition.



## First book on 8256 launched

SIEMA Press launches a book devoted to Amstrad's PCW 8256 and 8212 machines next week.

Mastering the PCW 8256/8212 was written, inevitably, using Lotusword, and aims to complement the machines' manuals, as well as clarifying parts of it.

## Pagemaker for Master 128

Amstrad's Pagemaker, one of a number of publishing programs now on the market, has now been made compatible with the BBC Master 128.

The package comprises a typesetter, graphics library and word processor, spread over two 5.25-inch cartridges and two discs.

In addition, this version is capable of formatting files from both Wordwise and View.

Pagemaker for the Master 128 costs £48.95. Further information from Amstrad at 168-170 Watlington Avenue, Warrington WA9 6QA, 0458 433851.

It also derives access to New Star's NewWord word processing program, as well as the CP/M operating system in general.

It will cost £5.95.

Details from John Wiley and Sons, Baffins Lane, Chichester (0243 784311).

## RGB monitor

A NEW high resolution RGB monitor will shortly be released by Chromagraphics. Designed specifically for Spectrum 128, QL and BBC



machines, the monitor will be introduced at the competitive price of £229. It does not, however, contain a recent output.

Details from Chromagraphics at 128 Cliff Road, Harrogate, North Yorkshire.

## Computer LP from Mupados

DATAPACK, coupled with SoftWare?, is a highly unusual computer package to be sold exclusively through WH Smith's branches and produced by Mupados.

Datapak, on side one of the tape, is effectively a computer LP, featuring soundtracks from computer games. The games, which include Rambo and HyperSports, have all been re-mixed in a recording studio.

SoftWare? on side two, is rather more conventional. It

## Anirog spans G16 and Atari ST

ANIROG is taking advantage of increased C16 sales to extend to G16 packages. Winter Dreams, a six-screen Winter Olympics simulation, at £1.95, and Space Pilot (£3.95) will both be released for the machine at the end of the month.

Anirog also intends to tickle the Atari ST market this year, concentrating on entertainment programs.

is a database designed for young users.

The title should be available at WH Smith next week, priced at £4.95. Mupados can be contacted at Unit 11, Clumber Industrial Estate, Tuggeren Road, Llanpennar, Dyfed (0453 433817).

## Bag-Byte budget bonanza beckons

FOLLOWING the success of many companies with budget software, Bag Byte, now a publishing label within the Argus group of companies, is releasing budget productivity titles on disc.

Initially to be available for the Commodore 64 and 128, Bag 'n' Co is a range of titles licensed from the US, to be sold in the UK at £1.99 each.

The series includes a word processor, Masterword, a desk diary, Electronic Addresser, a database, giffen, a spreadsheet, Personal Spreadsheet, and two home accounts programs.

Details from Bag Byte, Library House, 222 Regent St, London (01-439 9046).

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Please allow 14 days delivery. Across Water No  
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## Letters

### Corrections

A couple of corrections to the final instalment of my wordprocessor (PCW 4-13/15).

Hardly the Deluxe function was misprinted as (CTRL) + A, it should, of course, have been (CTRL) + D.

Incidentally, when converting the program to run and work on tape, do not delete lines 2680, 2686 and 2673.

Glen Connell  
116a Ashbury Rd  
Oxford

### Autosave facility

May I say that W Wain's program on Autosaving programs on the Commodore 64 was a model of lucidity and genius comparable with your award high standards. However, again your blather, there is an autosave facility provided on the Commodore 64, contrary to common knowledge, eg. *John PUGHMAN'S* 'A' followed by pressing the *Shift* and *Run/Stop* keys.

Note the color, which must be included following the device number.

You may agree that this could be a little less cumbersome than a machine code program!

W H Corrick  
Pine Mayed Terrace  
Bangor  
Croydon

### QL judgement

The juxtaposition of the letters by Paul Hardy and Ken Whyld in Vol 8 No 10 on the subject of the QL makes its own judgement. Ken Whyld, who has used the machine regularly for over 18 months, finds it a great success.

Paul Hardy, with no claim to any experience as it and no sign of any knowledge of it, seems to wish to bury it in an unconnected slurry of computer-verse canards.

This machine seems to have been aroused by the letter in Vol 8 No 8 from LW Tomlin, again a user speaking from experience, expressing himself as so impressed by the positive qualities of the QL that the little critical newspaper is called for.

What Paul Hardy's barrage of incoherent diatribe of doctored parents foisting



"How was I to know it was that judgement's Printer number I was trying to put?"

unstable machines on unresponsible advertising, and of disreputable business seem doggedly demanding disreputable business software has to do with the comparative merits of the QL is quite beyond me.

There was certainly nothing of this in LW Tomlin's letter. There has equally been nothing of it in the actual selling of the QL. It has been consistently underwritten in the shops and overpriced in certain publications.

Ken Quince was thought to be a little careless of reality when he charged the word-

smiths. But at least they were real wordsmiths. He did not invent them for the fancied pleasure of knocking them down.

The micro drive? They are the poor man's disk. The great merit is their price. They are infinitely better than any cassette systems and in some respects they outperform certain disk systems.

I do not mind Zappa's having a reasonable dislike of the QL. I can always get my own back by reading that page last. But uninformative diatribes do annoy me as they obviously do many.

Time has come for a little guide to what is at the least an original and innovative machine.

I will stand any day at the shoulder of the Whyld and Tomlin.

Let the Hardies look to their laurels.

G C Watson  
Chickadee Rd  
Croydon

That's definitely enough correspondence on 'That Zippard'!

## Competition

## TOUCHMASTER

### Five Touchmaster graphics tablets to be won

If reading all about these graphic possibilities has inspired you, why not try your hand at some works of art yourself? You could win a Touchmaster graphics tablet.

The graphics tablet is a thin drawing area, equivalent to a piece of paper with an electronic stylus in place of a pen. With it you can create pictures which appear instantly on your screen. The big difference is that this pen and paper has options to use programmed circles, squares, rectangles, colour mixes and also different types of brush strokes.

The Touchmaster graphics tablet is available for a variety of popular machines (see coupon) and special Touchmaster software is also available from the manufacturers. Normally, the tablet costs £49.95, but we're giving away five to the winners of our Touchmaster competition.

#### How to Enter

We're simply asking for an example of

your own computer art - using any computer graphics program you like. That's all there is to it.

Send us your picture either as a screen dump, or on cassette or disc - it doesn't matter. Tell us what package(s) you used to create your masterpiece, and enclose the coupon with your entry.

Then post the whole lot off to Touchmaster Competition, Popular Computing Weekly, 12-13 Little Newport Street, London WC2N 1TP.

#### Entry Rules

Entries must reach us by Monday April 21. We cannot return entries, so if you really like your masterpiece, don't send us the only copy. Pictures submitted in the competition should not have been previously published elsewhere. The five pictures adjudged to be the best, taking the graphics software used into account, will each win a Touchmaster Graphics tablet. Only one picture per entrant please. The judges' decision is final and all normal competition rules apply.

#### Popular Computing Weekly Touchmaster Competition

Name

Address

Title of picture

Graphics package used

Machines (tick appropriate box)

- ☐ Spectrum 48K  
☐ Dragon 32/64  
☐ Commodore 64  
☐ BBC B

EAST

## SAI COMBAT

Set against a series of subtle backgrounds, *Sai Combat* has 8 skill levels and can be played by one or two players, with a choice of 16 moves. The combatant sprites are large and easy to control via keyboard or joystick.

[illegible]

**WEST**

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Amrad CPC	10.00
Commodore 64	15.00 (avg) 10.00 (std)

## Spitfire

[illegible]

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## ONLY THE BEST

**NOTES**

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# Looking ahead

David Lawrence and Mark England assess the 'graphic revolution' which has taken place with the launch of the Atari ST and Commodore Amiga

One of the problems that always faces computer manufacturers is that, when, new technology comes along – say in the form of more freely available 16-bit processors – there are always two things that you can do with the increased power. Firstly you can decide to do existing things faster and better, which is what usually happened in the early days of the home computer.

Alternatively, you can decide to do something new that previous generations of machines couldn't have handled at all. The decision is a very real one, because if you get it wrong the market will very quickly leave you behind, as Sinclair found when the QL was launched. Comparing it to a Spectrum, no-one could really see what the power of a 68000 was being used for.

This year, manufacturers are in the happy position of knowing exactly what to do in order to satisfy the public. Whatever size a new machine must be, in order to be taken seriously it must represent a giant step forward in its graphical capabilities.

The forerunner of the whole revolution was, of course, Apple's Lisa and Macintosh. To Apple goes the credit for making a reality of the fashionable prediction that one day users would be able to work with a simple graphical display like a desk-top. In 1986 it is difficult to imagine anyone launching a serious personal computer that doesn't work in this way, but the window-icon-mouse-pointer style of things is only one small part of the graphics revolution.

The most important thing to realise about the latest generation of graphics machines like the Atari ST and Commodore's Amiga is that the changes aren't just cosmetic. It isn't just a matter of taking a boring 16-bit micro and adding a bit of software to draw a few pictures on the screen or to make a few machines take easier to program. The new generation are in many ways built around graphics.

When you power up an Atari ST, the graphics routines that provide the graphical display of files and menus are embedded deep in the Digital Research designed Gem operating system. Where previous generations of machines had operating systems which knew how to access the screen, disc drives, printers and keyboard, the increasing number of Gem machines also know how to draw lines, polygons, cir-

cles, how to overlay a part of the screen with a box and then remove it, how to create a simple menu or move a design smoothly around the screen, how to dump a high resolution image to the printer. Tasks which software writers in the past spent days or weeks on can now be carried out by one or two simple instructions.

Commodore's new Amiga takes the process even further than Gem, with an operating system that is capable of moving or even accelerating objects around the screen without detailed supervision from the program. Perhaps the icing on the cake is that the Amiga operating system can be supplied with a list of



separate images which it will then present in a series, thus making animated sequences a simple matter.

Nonetheless the revolution in operating systems goes the revolution in hardware. Some of that revolution is not in the least technical. On a 68K micro, it is not surprising that few people are much taken in high resolution displays which took up more than half the available memory for a single picture. With Atari launching a one megabyte ST for less than £1800, the situation becomes a little different and the ST's 128 screen must now surely become the basic standard for future machines.

Other hardware features are not quite so familiar but they are almost all to do with solving two problems: firstly that continuous use of high resolution graphics can make big demands on the CPU chip on which the system is based, and secondly that the CPU is not necessarily

the best kind of chip for carrying on some of the tasks that graphics involves – it's simply too complex.

High resolution graphics uses a lot of memory. This is no problem from the point of view of the amount of memory available in total but constantly manipulating upwards of 128 of screen memory is an enormous task. Even the current favourite CPU, the 68000 has its limits and among them must be the fast and smooth scrolling of a 128 screen. It's not that it can't be done, simply that to do it requires a high proportion of the processing power available.

The solution is to take as much as possible of the graphics work out of the hands of the 68000 and place it into the hands of dedicated chips. Commodore showed this years ago with the 64, an unconventional machine in basic yet with quite outstanding graphics facilities provided by the specialist Vix chip.

In the current generation Commodore will appear to have the edge with the Amiga's Agnus and Denise chips. Together these chips take out of the hands of the 68000 the tasks of line drawing, moving blocks of screen (or the whole screen) around, the handling of sprites, the waiting for the screen display to refresh itself and the translation of colour information in memory into a form suitable for sending to the screen. In the Amiga's case, not only are the tasks carried out faster, it also means that the main part of the system can get on with multi-tasking.

How long this edge can be maintained is anybody's guess, but it is significant that Atari, whose ST already appears to have one of the fastest screen displays around, at far less than the current price of an Amiga, have announced that buyers of the new one megabyte version of the ST will have the option of adding a "faster" or "black image-transferrer" in the near future.

All of this is good news to the consumer. Properly designed graphics-based systems are easier and faster to use than text-based machines. Properly designed programs on graphics-based machines can be given all the attractive features of the machine with very little work on the part of the programmer. Indeed, one of the quickest and best ways of assessing software on the new machines is going to be to check whether they do make use of the enormous graphics capabilities at their disposal.

Finally, and perhaps most importantly, it's good news because the reaction to the ST and the Amiga have shown that graphics is the way that buyers want to go. They have generated an enthusiasm that has been missing for a long time. Nothing that enthusiastic, several other manufacturers are waiting in the wings to enter the fray. With Atari launching a 512K television-based ST for less than £400, the battle to bring the graphics revolution into the mass market is about to begin.

# THE PLANETS

[illegible]

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Journal of Internal Medicine 247: 399–406

**POORLY KNOWN**—It's hard to imagine, even the results of Springer's research are often not known, have been incorporated into the design of that code and subsequent codes.

And red fire is pure, and a very challenging one at that. The longer I burn, the stronger the glow. For enlightenment candles are all non-toxic. I burn them for my life. I love to watch people use them.

For those able to access a computer, the [www.ohio.gov](http://www.ohio.gov) site offers a "How to Find" page and guides for finding what you're looking for. For example, the [www.ohio.gov](http://www.ohio.gov) site will guide you through finding the state's public schools.

SPECTRUM Jan/Feb 1995 \$9.95

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mortech

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# THE WRITER



## “The Best”

When it came to reviewing the best in sportsmanship for the *Spectator*, *Time*, *Spotlight* (1966, 1968) and I have no doubt that “The Writer” will take first in the best Sportsman category.

“The Writer” has been mentioned in 171 out of my 228 best articles.

And just in those publications, there are 177 others, even today, “The Writer” is mentioned.

“The Writer” is mentioned in 171 out of my 228 best articles. “The Writer” is mentioned in 171 out of my 228 best articles.

“The Writer” is mentioned in 171 out of my 228 best articles. “The Writer” is mentioned in 171 out of my 228 best articles.

“The Writer” is mentioned in 171 out of my 228 best articles.



“The Writer” is mentioned in 171 out of my 228 best articles.

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“The Writer” is mentioned in 171 out of my 228 best articles.

“The Writer” is mentioned in 171 out of my 228 best articles.

“The Writer” is mentioned in 171 out of my 228 best articles.

# THE ARTIST



## “Better than the Best”

When we launched “The Artist” in 1965, it was reviewed in the most interesting, perhaps perhaps to have appeared for the *Spectator*, *Time*, *Spotlight*, *Time*, *Spotlight* (1965, 1967) and I have no doubt that “The Artist” will take first in the best Sportsman category.

“The Artist” has been mentioned in 171 out of my 228 best articles.

“The Artist” is mentioned in 171 out of my 228 best articles.

“The Artist” is mentioned in 171 out of my 228 best articles.

“The Artist” is mentioned in 171 out of my 228 best articles.

“The Artist” is mentioned in 171 out of my 228 best articles.

“The Artist” is mentioned in 171 out of my 228 best articles.

“The Artist” is mentioned in 171 out of my 228 best articles.

## The missing link

**A**s part of this month's *Graphics* feature we look at the hardware. Devices that form the link between your hand and the computer screen – which most closely matches your hand movements to plotting on screen?

### Sophisticated

**Program:** MS-8000 Mouse Commodore 64 (also MSX) **Price:** £89.90 **Supplier:** Wignmore House, 32 Serle Row, London W1X 1AG

If you want the best in graphic packages, you should invest in a mouse – specifically, the Wignmore House MS-8000, which certainly outperforms any of its rivals. We've looked at this product before, but, to recap, the MS-8000 is an excellent piece of hardware, based on the familiar mouse principles of a rolling ball beneath the unit to register movement, and two sensitive switches on the top. The software is also



very sophisticated, and is entirely controlled by icons.

The graphics software, *Chassis*, is available on tape or disc, and a flow version is planned. The command

lines appear on the bottom of the screen, and to select your option you merely move the arrow over it.

All the usual options are there:



freelance draw, line draw, dotted line, box, circle, fill, copy, delete, circle, solid circle, pencil thickness, "erase", zoom, mirror, flip left/right, and printer output.

What is unusual is that all the drawing is practically instant, the file very quick, and the "file" effects in which you can paint whole areas in a pattern selected from choices are amazing.

The MS-8000 is a hefty £89.90, but worth every penny. It has its disadvantages; for instance, you cannot transfer tape files to disc if you update, and there is no text entry option. However, forthcoming software releases will include much more sophisticated packages, and the *Chassis* package provided with the mouse is very good to be getting on with.

Chris Jenkins

### Flexible

**Hardware:** Megamouse plus software: *Chassis*, *The Artist* **Price:** £67.50, *Chassis* £29.90, *The Artist* £37.50 **Mouse:** MSX 2 (conversion to Commodore 64 planned) **Supplier:** Wignmore House, 32 Serle Row, London W1X 1AG

**W**ignmore House's modestly named Megamouse is a sturdy looking device, and surprisingly heavy. The rotating ball is coated with rubber to enable you to use it more easily on a smooth desktop, and it has three control buttons at the front, allowing for flexibility. With a resolution of 180 points to the inch, it is compatible with AMT's mouse, so if you already have AMT's device, you can still use Wignmore's software.

Software as far designed for use with the Megamouse comprises *Chassis* and *The Artist* (which is unfortunately not a package but a different program).

*Chassis* is entirely icon driven – the icons are placed along the bottom, and down the right hand side of the screen. As its name suggests, it is a design aid, rather than a picture creator.

*Chassis* offers a bewilderingly large set of options: it will work either in Mode 3 (two colours, hi-res) or Mode 1 (four colours, medium res), lines, fill, rectangles, circles, ellipses, polygons, rubber banding, cross-hatching, airbrush, continuous or coordinate update, drag facility, duplication or infection, instant dimension lines, area to exact degrees, change speed of mouse mirror image; in fact, everything, and you can design the keyboard sink. To be taken seriously.

*The Artist*, which runs in Mode 2, uses two separate screens for menus, which you must click to find the drawing area to select options. Again, it's very flexible, and has the added perk of an animation option. All the usual drawing options (fill, airbrush, etc) are here, plus some extras. A zoom mode is available, so that you can enlarge any area of the screen to get the drawing exactly right.

It will take in digitised pictures and alter them, and you can design your own brush – choose red and white stripes and draw long lines of toothpaste, for example. The only quibble is the fairly hefty price tag of £68.

Wignmore also supplies a separate utility pack for both programs at £12 which allows you to do colour screen dumps.

Christopher Jenkins



# Graphics Hardware

## Worthy buy

**Program:** Trojan Cadmaster Micro Commodore 64 Price £129.95 Supplier: Trojan, 368 Darhway, Dunvant, Swansea SA2 7TF

**T**rojan produces a number of lightpens, including models for the Dragon and BBC. Cadmaster is the Commodore 64 version, and a worthy buy, offering use of all 16 colours as the 64, pixel accurate graphic-editing, and a huge range of commands.



Particularly interesting are the Quil options which give lines thicker along one axis than along the other.

At £129.95 the Cadmaster is not as advanced as the Microscribe, but offers more graphics options.

Chris Jenkins

## Option range

**Hardware:** Amicon Microscribe Lightpen Micro Commodore 64 Price £29.95 Supplier: Amicon, 82-84 Queen's Road, Reading, Berks, RG1 4BF

**F**or ambitious graphic artists who want more than software packages, it may be worth investing in some specialised hardware, such as a lightpen. Up until recently most lightpens were available and poorly supported by software. Now there are several on the market which come with excellent graphics software, and are engineered to much higher standards.

All lightpens work by roughly the same method. By checking the position of the cursor against the screen scan timing, the software can react to the position of the lightpen on the screen to alter the graphics displayed. It's a fast and very easy way of controlling graphics.

The Amicon Microscribe Lightpen is a sophisticated piece of technology, which dispenses with the necessity for using any keyboard controls by having a sensor built into its tip. The



barrel is of stainless steel and there is a long flexible lead.

The lightpen plugs into the 64's joystick port. The software, provided on cassette with an option to dump to disc, interacts very well with the hardware, to the extent that the cursor will react to lightpen movements even when the pen is close to four inches from the screen.

The graphics software Quil (there are two other programs with the package, a graphics calculator and a programming utility) offers a good range of options, selected from a series of menus using the pen.

At £29.95 it's worth considering if you dislike the clumsiness of a joystick-driven system.

Chris Jenkins

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# The Pixel Palette

**F**or our special feature this month, we are looking at graphics on your micro. Here we review some of the most interesting software packages, looking not so much at those that would be useful for artists as those that make artists of us all...

The idea of what a graphics package is has changed recently. It's a change as much to do with intentions as it is to do with technology.

Even a couple of years ago all that was expected of a graphics program was that it should give the artist features and flexibility that were as close as possible to those of paint and paper, with some instant geometric shapes and a few time saving elements thrown in. The presumption was that the skills necessary to create pleasing results were acquired elsewhere. The programs were tools for artists more than tools to make people into artists.

Recently that view has changed. Some of the programs mentioned here have features so powerful that familiarity with the system and imagination have become considerably more important than the computerised equivalent of conventional drawing skills. Get a shape right once and you need never get it right again - use powerful commands to take that shape and repeat it endlessly on your screen. Getting precise details right is made much simpler by options to magnify the screen and work pixel by pixel... and so on.

Colourpace, though conceptually different from the other programs here, with different intentions, exemplifies some of the changes outlined above. It produces astounding and changing graphic visions, using principles of sequencing more like those found in electronic music...

## Drawing mode

**Program:** *Degas Micro ST Price*  
**£20.95 Supplier:** Aristoach, 68  
Long Acres, London WC2E

**D**egas is one of the first graphics packages for the ST, apart from those supplied with the machine. It is quite astonishingly easy to use, but fairly powerful. The mouse helps, of course, the cursor used both for menu selections and the actual drawing on screen.

Degas uses a straightforward command format - options are simply listed in a series of menus and boxes representing choices. Combinations of choices are highlighted. It doesn't look particularly elegant, but proves considerably more helpful than a series of dodgy icons.

There are 15 brush styles available with a choice of drawing modes, depending on whether your current task is freehand sketching or precision plotting of individual points. As a feature distinct from the brush style, there is a choice involving the actual kind of line drawn, eg. continuous, dashed, dots and dashes.

Degas can be filled with textures derived from a choice either of 32 preset patterns or from patterns you have customised yourself using a grid

representing each individual pixel. Again the mouse cursor is used to switch on and off the individual pixels.

More advanced features include copying blocks of screen from one location to another, particularly impressive is X-Ray Copy which takes your defined block and superimposes it on top of the existing background without rubbing existing designs out. Another excellent feature with a wide number of possible parameters is Shadow which allows you to generate a 'shadow' of your drawing at a specified distance and direction.

Text and Font features form a significantly larger part of Degas than most other graphics programs. It is possible not only to design your own Font styles, but to use those styles in various permutations of height and width within Degas. All features associated with drawings can be used with text including X-ray superimposition and shadow.

The manual explains the features of Degas very clearly and includes some useful technical information on printing out your pictures, should your printer be significantly different from those already provided for on the Degas disc. Easy to use and powerful too. What more could you want?

Grisham Taylor

## Detailed

**Program:** *Art Studio Price* £24.95  
**Micro Spectrum Supplier:** Rainbow, Upper St Martins Lane, London WC2E

**A** graphics program so good it not only has every feature professional artists could possibly want, it even does its best to rewrite the decreed Spectrum hardware.

Art Studio has a feature which will ensure that your designs and drawings do not overlap an attribute square. It means that, although you can position everything exactly where you want, you can ensure that colours will always fill properly without any unexpected staircase edges of the wrong colour.



The icons used with Art Studio actually appear to help rather than hinder finding and selecting the right commands - not always the case.

The drawing pan is definable from a single pixel for highly detailed work to a spray of pixels for an airpen effect. Like Degas, there are extensive provisions

for incorporating your own fonts in the program.

Conventional features like circles, ellipses, squares and rectangles are mixed with sophisticated options like 'magnify' - to examine a section of screen in great detail - and block options to take an area of screen, manipulate it both in size and position and replace whatever you wish on the screen.

The program can be customised to work either via the keyboard or using mouse or joystick. The version of Art Studio for the 128 makes use of the greater memory of the machine for picture storage, but is not significantly different in any other way. Versions for Commodore and Amstrad are in preparation. A narrative program.

Grisham Taylor

## Pedigree

**Program** Melbourne Drive Micro  
**Amstrad Price** £24.95 **Supplier** Melbourne House, 60 High Street, Hampton Wick, Surrey GT6 4DB.

**T**hough there are undoubtedly more sophisticated packages, the Spectrum version of Melbourne Drive is probably still used by more programmers for games graphic design than any other package. The reason for its success seems to be due not so much to its range of functions as having the right functions – it is possible to achieve just about any effect using one combination of facilities.

Melbourne Drive has now been converted to the Amstrad, where data and results are potentially far more impressive than on the 'you can't put that colour 'ere mate' colour attribute problem-ridden Spectrum.

Commands in Melbourne Drive are rather like those in Lotuscape and other business software. To begin with, selections are made via a series of drop down menus.

Once you become familiar with the program almost all of these options can be accessed by simple one or two letter commands.

The real strength of the program resides in the way you need only do anything once. For example, if you design a complex shape (referred to by the program as a 'feature') you can get the program to remember it and then use and reuse that feature in any part of the screen.

You can even 'paint' with it, creating complex multi-layered effects. Sections of the screen may be similarly defined as blocks and mirror effects may be



achieved about either a horizontal or vertical axis.

There are paint spray effects, a choice of cursors, you can include text in your patterns and it has the ability to save not only pictures, but textures as well. The tape includes three basic programs for loading completed pictures into your own programs (one for each screen size) and an extremely helpful manual.

For final proof of just what this program will do on the Amstrad, take a look at some of the demo pictures provided with the program.

Graham Taylor

## The Inner light

**Package** Colourspace Micro  
**Amstrad £20.97 Price** (£19.95 **Supplier** Alanworth, 48 Mount Pleasant, Teddley, Haris.

**C**olourspace was originally developed at Psychodelica on the Commodore 64, but the £20.97 version is superior even to the version of Colourspace on the sight for Amstrad.

This is a live interaction 'light synthesiser', creating moving patterns under the control of a joystick (on the 580, the mouse). A cursor dot can be switched on or off and there are seven symmetry modes, four 'local lighthouses' creating patterns close to the cursor position, four 'global light towers' for the whole screen, 'explosion' and 'implosion' modes, horizontal and vertical expansion, etc.

Streaming lines of blocks, squares, circles and so on can be created, as can more three-dimensional rotating patterns. The 580 Colourspace is compatible with Amstrad, the graphics package bundled with the 47, so it's possible to load in still pictures and create moving patterns over them.

If you're prepared to accept slightly slower plotting, it's possible to use



a Sheffield background with various types of symmetry, which gives effects like the final screen of 2001. Colour and colour rotation, symmetry and complexity of the patterns can be varied 'live'.

Although it can be sequenced, Colourspace is basically a live performance 'light instrument', a comparison with the opening credits of *Dr Who* being only a starting point. Inspired by 'Pink Floyd, Genesis, The Beatles, Marillion, Rush and many more', Colourspace can truly be described as the 80s equivalent of the glass harmonium, only better. It really has to be seen to be believed, and should be a compulsory purchase for anyone interested in exploring the graphics abilities of the 57.

Chris Jenkins

## Textured

**Program** QL Paint Micro **QL Price** £24 **Supplier** Sinclair Research, Milton Rd., Cambridge CB4 4BE

**N**ot a lot of people know this, but Tulse is the company responsible for the Amstrad version of Melbourne Drive featured also on this page. Sinclair's QL Paint program was also written by Tulse and is very similar to its Amstrad counterpart.

QL Paint uses the same mixture of commands and drop down menus, although icons are used to represent the main menu options. I'm becoming

less and less convinced by icons – the 'picture worth a thousand words' principle only works where the meaning of the picture is abundantly clear.

The features of the QL program are almost exactly the same as those on the Amstrad Drive. Basic drawing is via a variety of brush styles including an airbrush effect which gives a slightly heightened spray area.

Block commands allow you to include a section of your screen, save it, and use that defined section of will on the screen. Having drawn one house, for example, you could use a block command to create a row of them. Blocks can also be manipulated by 'mirror' commands.

The texture command allows you to create an area of your own design which can then be used as the 'paper' for the brush. For example, you could design a simple pattern to represent bits of grass and then 'paste' an entire field of them.

A nice touch with the package is a short section written by a computer artist, not so much on how to use the program, but how to get the graphical effects you imagine.

Graham Taylor



# Graphics Reviews

## Simple

**Program:** Paintbox **Price:** £2.95 **Manufacturer:** Commodore 64 **Supplier:** Audioquest, 11 Chiltern Enterprise Centre, Station Road, Thetford, Norfolk.

One of the best specified home computers for graphics use is the Commodore 64, with its 16 colours and wide range of graphics modes. It's no surprise then that there is a good deal of powerful graphics software designed for the machine.

Many of the best-known packages, such as QuikDraw's DrawIt and the

Paint Aid and software distributed by Audioquest, have been available for some time and have been reviewed. There are, however, still good packages coming out, with a wide range of features and varying price tags.

Of the more recent releases, one of the best inexpensive packages is Audioquest's Paintbox cassette at £2.95. Backed with a version for the C 16 Plus/4, Paintbox is straightforward to use. Over-

coming the perennial problem of having to flip from a menu display to the drawing display by using a "backdoor" of options beneath the screen, Paintbox has a familiar range of drawing options: draw, lines, arcs, box, circle, colour, brush shape is choice of eight, fill, copy, delete, and so on. The 64 version has two separate drawing areas.

Pictures can be saved or loaded in tape or disc, and control is by keyboard or joystick. Paintbox is certainly a good beginners' package.

Chris Jackson

## Fine Art

**Program:** The Artist **Manufacturer:** Spectrum **Price:** £9.95 **Supplier:** Softtechnics, 12/13 Henrietta Street, Covent Garden, London WC2E 8LE.

The Artist is another graphics program for the Spectrum. In features it closely rivals the Art Suite and for some people can be considered an equally valid choice.

There are facilities to cut and paste sections of drawing, to enlarge the local area being worked on for fine detail work, as well as a choice of brush sizes and paint textures.

The Artist also includes extensive Undo handling facilities so that both text

and fill patterns can be totally redesigned.

The Artist uses a system not found in most other graphics packages to define line positions. The screen actually contains two cursors, one is the conventional one controlled by keyboard or joystick, the other is a "reference" cursor which mimics the movements of the main cursor at a given distance. Lines can be drawn from reference to main cursor or, in other modes, the two cursors can be used to random for parallel effects.

It's worth mentioning that the version of The Artist currently available is shortly to be superseded by Artist II. Although unseen at present this is claimed to have built in routines for connections to a wide range of printers, lightpens and mice. The cut and paste facilities are



enhanced and spray effects are included.

Price for The Artist II will be £14.95 and it is intended to be compatible with most modes of mouse, as well as the more common joystick.

Graham Taylor

# C FOR YOURSELF

• This book is an ideal companion either as a practical introduction to the C language or as an aid to the quick development of a wide range of applications.

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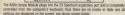


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| OS and PC needs      | Testimonials: None                  |

**Test results:** (a) The Multisim 8088 computer with signal input loads.  
(b) The Verilog software on FPGAs compatible with multichip.

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Revised manuscript accepted for publication 22 May 2014

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## Terms and jargon

**F**inally, this week, thank you to everyone who has written to me with queries and ideas for the column. I'm still ploughing through all the correspondence, but I'll devote a Communications page soon to answering them.

In this issue, however, in response to a number of pleas, I'm going to start a glossary of terms and jargon (and there's plenty of it) associated with networking.

Some of the terms may seem very basic, like, for example, the word *modem* itself, but bear with me.

### Accl

The industry standard series of codes which represent different characters, eg. A has the ASCII value of 65. When modems talk to each other it is Accl codes which are sent. Accl stands for American Standard Code for Information Interchange.

### Adcl

A variation of the standard Accl used by Atari. It stands for Atari Accl.

### Baud

The measure of speed of data transmission in bits per second.

### BB/RS

These are abbreviations for Bulletin Board.

### Bulletin Board

This is a free service similar to Frotel/Microware. It has many features including teleconferencing and E-Mail.

### Carrier Tone

This is the name of a tone which is given if a modem is on line.

### CCITT

The name of a body of people who have established world wide standards in speeds and other areas of communication. America is about the only country not to comply to these standards.

### Communicate

The name of the software on which the IBM boards and some others run. It is older and Frotel compatible.

### Dumb Terminal

This is the name given to a terminal on a network which has no computing ability. It is purely for transmitting and receiving of data. It has no 'intelligence', hence it is dumb.

### Duplex

This describes whether communication is one or two directions at one time. **Full Duplex** - communications in two directions and data is sent in both directions at the same time. **Half Duplex** - communications in two directions but data is only sent in one direction at one time (sometimes called Simplex).

### Echo

Echoing in printing of transmitted/received data to the screen or printer. **Local Echo** - This means that the data transmitted by you is 'echoed' or printed on your screen.

### Electronic Mail (E-Mail)

This is a system which enables a person (or company) to have a 'mailbox' on a bulletin board. People can leave messages to the owner of a mailbox, and the owner (and nobody else) can see those messages or mail boxes the same electronic mail.

### Information Provider

This is a person or organization who provides information for Bbs. The largest and best known IP is Microware BBS, which is an information provider for the Frotel BBS. Similarly is another large IP on Frotel BBS are not only for Frotel but for many of the other 'free' public Bbs.

### Intelligent Terminal

Simply the name given to a terminal on a network, which has computing power internally and doesn't have to use another computer to perform all of the calculations etc., which it has to perform. Your computer with its modem is an intelligent terminal. This is the opposite to a dumb terminal.

### Modem

Stands for Microcomputer Data Modulator. It converts signals from the computer to tones which may be transmitted over the phone lines and then converted back again.

### Microware-BBS

The information provider on Frotel which provides all of the information associated with computers and home computing. Microware is Frotel's largest database with almost 25,000 subscribers. It is about to launch a 'Sunday Supplement' type magazine area, which will deal with many subjects not directly connected with computing.

### MUD

Stands for Multi User Dungeon. It is a multi-user adventure which was begun at Essex University and is now available on computer and also from British Telecom. Many people with modems may log-on to a MUD game at the same time, and as they play they can meet each other, have fights, battles, conversations or even make friends. MUD is transmitted via telnet and I'll report on it soon.

### Multiplexer

This is a device which combines data from many terminals into a single stream of data which may be sent over the phone lines. In the other end, another multiplexer can convert this single stream of data back to many individual

sets of data, the same as were sent.

### MSDOS

The name of a piece of software on which some Bbs are run, on the IBM PC.

### Paralle

Refers to an interface used for parallel data transmission. The Centronics interface is the most common example on the market.

**1)** An expensive method of transmitting data, it involves sending the whole binary ASCII value of a character at the same time. Parallel transmitting is used a lot for sending data to a printer.

### PSB

**Packet Switching System.** PSB enables you to call all over the world at the cost of a local phone call. You could phone Australia for the same charge as your next door neighbour. An initial charge, as well as quarterly fees do make PSB expensive to the average user. More on PSB in future columns.

### Frotel

The name of the largest BBS in Britain. It is run by BT.

### Protocol

The data protocol is the number of bits, any bits and whether or not the parity of the data is even, an example is 1 data bit, 1 stop bit and odd parity.

### Rx

Abbreviation for Receive.

More glossary and terms next week, in the meantime here's this week's BBS Top 10:

Rank	Location	Baud
1	Wells	300/300
2	Wells	300/300
3	Wells	300/300
4	Wells	300/300
5	Wells	300/300
6	Wells	300/300
7	Wells	300/300
8	Wells	300/300
9	Wells	300/300
10	Wells	300/300

These are Bbs for you this week: the first one's BBS in London, it's 300/300 baud, 24 hours and number is 01-573 0071. Secondly there's the 0000 BBS, that's 0000 as in 0000r Computer. It too is 300/300 baud and is in Tyne-side, the number's 081-695 1944 and it's 24 hours a day.

Lastly there's C68, this too is 300/300 baud but it's also a ring back board. I don't know the house but the number is 01-435 2647 and so it's obviously in London.

David Wallis

If you have any queries, tips or comments to make about any aspect of future communications, David Wallis would love to hear from you. Write to him at Popular Computing Weekly 12-13 Little Newport Street, London WC2N 7PP.

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## INFINITE COLOURS

by Carl Whalley

**D**o you know that the only colours a colour TV tube can produce directly are red, green and blue? So how come there appears to be an infinite variety of colours on the screen when you sit down to watch your colour telly? The answer lies in the way the individual dots are arranged on the screen, their comparatively minute size and most importantly a human quirk of biology.

It so happens that when your eyes see two colour elements next to each other, and you are sufficiently far away, your brain is 'fool'd' into thinking only one colour is present. This colour is a blend of the two actual colours present and the result is a new, third colour. For example if two dots are red and green, the observed 'secondary' colour will be yellow. So varying the proportions of the three primary colours on a screen 'fools' the eye into believing a variable colour is displayed.

OK, so what is this fascinating information doing in a computer mag? Because it is possible to project these ideas of producing new 'secondary' colours from the fundamental 'primaries' on to the Amstrad (as any pixel-definable colour computer), and display colours not directly available with the use of the bit (or equivalent) command. In Amstrad's case we have 27 possible primaries, so the result of blending these will result in many subtle variations of the one basic colour produced.

To achieve the blending effect the program creates a 'chequerboard' pattern, with the dots alternating between the two colours on alternating lines. This is done by defining a character as the required pattern and printing it in one bit on a background of another bit, filling the top three-quarters of the screen. Then the user is able to set each bit in any of the 27 possible colours. Note at this point that certain colour

combinations produce strong interference patterns on the screen, which appear as curved bands running from top to bottom. While being very pretty in their own right they do rather distract from the concepts presented in this article.

Included is a feature to alternate between pixel resolution (low, medium, high) and the patterns seems to be more pronounced as the resolution increases. 'Rainfally' will loop through all the possible combinations at the set speed, and 'D' sets this speed.

Best? You could display more colours in the higher resolution modes than is otherwise possible (for example Knight Lark is in Mode J — count the colours seen, though). In fact, in fact, it should be possible to create even more colours than described here with the use of more pixels per secondary. So don't clutter about, blend it and create colours never before seen by the human eye!

```

1 PRINT:PRINT ALL "L. SIZES OF SCREENS (PRINT/2)
20 FOR I=1
30 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
40 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
50 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
60 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
70 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
80 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
90 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
100 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
110 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
120 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
130 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
140 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
150 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
160 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
170 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
180 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
190 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
200 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
210 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
220 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
230 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
240 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
250 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
260 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
270 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
280 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
290 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
300 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
310 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
320 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
330 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
340 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
350 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
360 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
370 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
380 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
390 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
400 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
410 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
420 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
430 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
440 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
450 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
460 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
470 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
480 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
490 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
500 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
510 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
520 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
530 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
540 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
550 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
560 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
570 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
580 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
590 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
600 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
610 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
620 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
630 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
640 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
650 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
660 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
670 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
680 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
690 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
700 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
710 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
720 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
730 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
740 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
750 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
760 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
770 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
780 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
790 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
800 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
810 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
820 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
830 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
840 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
850 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
860 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
870 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
880 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
890 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
900 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
910 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
920 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
930 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
940 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
950 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
960 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
970 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
980 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
990 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)
1000 IF I=1 THEN PRINT "L. SIZES OF SCREENS (PRINT/2)

```

```

270 FOR I=1
280 FOR J=1
290 FOR K=1
300 FOR L=1
310 FOR M=1
320 FOR N=1
330 FOR O=1
340 FOR P=1
350 FOR Q=1
360 FOR R=1
370 FOR S=1
380 FOR T=1
390 FOR U=1
400 FOR V=1
410 FOR W=1
420 FOR X=1
430 FOR Y=1
440 FOR Z=1
450 FOR A=1
460 FOR B=1
470 FOR C=1
480 FOR D=1
490 FOR E=1
500 FOR F=1
510 FOR G=1
520 FOR H=1
530 FOR I=1
540 FOR J=1
550 FOR K=1
560 FOR L=1
570 FOR M=1
580 FOR N=1
590 FOR O=1
600 FOR P=1
610 FOR Q=1
620 FOR R=1
630 FOR S=1
640 FOR T=1
650 FOR U=1
660 FOR V=1
670 FOR W=1
680 FOR X=1
690 FOR Y=1
700 FOR Z=1
710 FOR A=1
720 FOR B=1
730 FOR C=1
740 FOR D=1
750 FOR E=1
760 FOR F=1
770 FOR G=1
780 FOR H=1
790 FOR I=1
800 FOR J=1
810 FOR K=1
820 FOR L=1
830 FOR M=1
840 FOR N=1
850 FOR O=1
860 FOR P=1
870 FOR Q=1
880 FOR R=1
890 FOR S=1
900 FOR T=1
910 FOR U=1
920 FOR V=1
930 FOR W=1
940 FOR X=1
950 FOR Y=1
960 FOR Z=1
970 FOR A=1
980 FOR B=1
990 FOR C=1
1000 FOR D=1

```

detected, and then use a special number to trigger the sequence (N in the example below) which would be followed by the byte to be repeated and the number of repetitions. So 00.00.2.2.2.2.2.00.00.00.00 would become 00.00.N.2.5.N.00.4. This is, in fact, the method used by my program.

If the biggest  $N$  occurs in the original source memory, it has to be stored in  $K, E, I$  so that the decompression routine will work correctly. For this reason it is a good idea to choose a value for  $N$  that is fairly uncommon - I eventually picked on 350 as being an unlikely combination of colours in the various graphics modes.

So that the compression and decompression routines worked quickly it was fairly obvious that they would have to be written in machine code; the completed code has been stored as a series of hex codes from 1000 000 to 0000 0000.

Once typed in, the program should be saved before attempting to use it. Typewriters should now make sure they have enough blank space (around four blocks) to record the compressed demo-screen on.

The first few times the program is run, you may find it stops and says "Checksum error". This means you have made a mistake, either in PROCassemble or the data lines, and you should check carefully and correct.

Once it runs successfully the demo screen will be shown and tape users should press **Forward/Play**, etc., followed by **Return** as normal; no message is displayed in order not to disturb the picture picture.

The demo screen will then be compressed and saved to the tape or disc under the filename "DEMO". If this does not seem to have worked correctly, check through the rest of the program carefully. If the compression option is working correctly the screen should have been compressed from a massive 20480 bytes to around 100 - i.e. the screen is now stored in under 5% of the original amount!

After the screen has been compressed and saved you will be prompted to press the space bar - tape users should review the save button choice.

The compressed screen will then be loaded back in and decompressed, block by block.

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

Insert the routines in your own programs you will need to incorporate **PROCRd**, **PROCrassemble** and data lines into the program. You should also include a line calling **PROCrassemble** near the start of the program, so that the machine code can be assembled before execution.

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compressed screen to or from a tape/disk,  
you will need to use WinZip.

PROB2000 takes four parameters:  
PROB2000 JPA, and CFI, where:  
PA is the minimum the network is to be saved  
nodes

57% in the starting plays in memory of the person in his command.

FM is the finishing piece in memory of the person in his command.

OP, determines the operation -  $\odot$  for composition,  $\uparrow$  for decomposition.

The starting and finishing points for graphs in Modes 0, 1 and 2 are 8000 and 8797 respectively; for Modes 4 and 5 they are 8000 and 8797 respectively.

The machine code is assembled at 8000, is 100 bytes long and is relocatable. In addition two page locations 870-87A, are used as control workarea for the system.

Because the machine code is assembled at 8000, the user-defined character area, you will run into problems if you try to define any characters.

If you wish to do this, you must re-position the code for changing life, to line 113.

Perhaps the safest way to find a new value for  $P_1$  is to go into the *Model* you are going to be using and type **PYMT** **MINIMUM** **1.00**. Run **MINIM** to this figure after any *Model* changes, and see  $P_1$  in *Box* on **Line 2.0**.

Other possibilities include 4800 if you are prepared to include the function key facility, 8000 for tape users; and 4800 or 4400 for disc users.

[illegible][illegible]



**Formula One**  
**TAU CETA**

**THE ROCKY HORROR SHOW**

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## EXTENDED BASIC

by Eric Deghaya

**L**ast week we looked at how we can tap in the Basic interpreter and introduce our own commands. But a problem appeared: how to control a large number of commands while still having a program that can be easily changed to particular needs.

One of the ways of solving that problem is by using some sort of "look-up" table. The idea is a bit like using a phone directory: if you want to contact someone, the first thing you do is to look for their name in the directory. If it is not there then they do not possess a telephone. But if you find the name then you can look on the adjacent column for the number. I will use a similar technique here: we take a character from the Basic text and compare it to all our possible commands. If a match is found, the address of the particular routine concerned is found in an adjacent table. The address is picked up, and the program jumps to that particular address. After execution of that routine, control is given back to the Basic interpreter.

In the event that no match is found in the table, the program will jump back to the routine which executes a "standard" Basic statement.

The program is divided into five parts. The first is just the initialization and the change of the vector address. Then next we have the routine that checks if we have a valid command, followed by the routine that puts the address of the particular routine.

Next we have the routines themselves which are called from Basic. (I will refer to these from now on as "modules"), and finally the various tables containing the possible commands and the addresses.

The very last part is a routine that will create the address table, and once your extensions have been completed and tested and your table is filled, you can delete this routine, but it is most useful if you want to assemble at other addresses than \$C000.

### Program Notes

Whenever the return key is pressed, the

characters typed in are checked by the program. What is checked first is an identifier character, in this case an under-dot mark (this serves looking through the whole table for every character).

If the character is truly a "I" then we check on the following character by going through the whole table and looking for a match. Once a match is found, the position of the command in the table will be held in A. We then use the content of A to get the address of the module, and jump to that particular address. Simple isn't it? . . .

The modules included will work as follows:

It will change the colour of the border  
It will change the colour of the screen  
It will change the colour of the character

After initializing the extension, try and run the following Basic program: 10 for n=0 to 15.00 print "hello"; 20 to 15 to 40 next n.

This should flash the screen while writing in different colours the word hello.

More next week.

1000	1000	1000	1000
1001	1001	1001	1001
1002	1002	1002	1002
1003	1003	1003	1003
1004	1004	1004	1004
1005	1005	1005	1005
1006	1006	1006	1006
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## Twice as difficult

**A**n interesting review package arrived on my desk the other day - a Spectrum 128 version of *Three Worlds in Paradise* from Micro-Cas together with a note apologising about not announcing it sooner. You may have noticed that other Shadow of the Unicorn, the much publicised range of Micro-Five games disappeared, or rather did appear but without the same notoriety.

Now it seems that all the effort in producing the games has not been wasted and there is still the option of making it at least twice as difficult for yourself to ensure *Wima* and the rest. (Incidentally if you aren't tired of the characters yet, it is better than any *Willy game* to date, showing a refinement of all the techniques used. Highly recommended to any 128 owner).

What I can't understand is why the Spectrum 128 is getting a lot of new games software that uses all the memory, but the Amstrad and Commodore 128X machines have very little. Perhaps it's because they have more disc software instead as you get the same effect in the end or perhaps a lot of Spectrum software writers have been released from the prisons that they were really reaching the limits of its abilities.

On with the tips. Mark Weatherill of Leighton Buzzard writes, "I have been looking at *Spectra* for the BBC and Electron by Superior Software and have discovered the following.

"If you type `MAIPE+ARADPARA` then `CALLM700` to start the game you will be able to see all of the maps.

"To re-encode any of the maps you need to find the codes by which they are represented in memory.

"The maps are all 50 x 50 blocks in size but there are only 32 different blocks, so each map can be represented by a five-bit binary code. This reduces the size of the map in Ram to only 640 bytes. Each line can therefore be represented by 160 bits or 30 bytes.

"Reading from right to left, if you add each line-32 sequences in turn it will produce a long string of bits 30 bytes long. Repeat for all the 32 lines of the map and you will end up with 960 bytes in all.

"There is one final trick though, when they are stored in memory each byte has

to have the order of its bits reversed.

"By experimenting with this system you will find that you can discover the map the maps are created and can be stored. To find out which code belongs to which block on the map, create a dummy which uses all the five-bit codes 00000 to 11111 in turn and note the results.

"To load a new map into the game in place of the existing maps you must "load the last part of the program to address `41100`. The first map will then be at `40800`, the second 840 bytes after this, etc.

"The anyone who thinks they will find this difficult, I have produced a program that will let new *Spectra* maps be created on screen and compacted. If anyone is interested I would be happy to negotiate a sale."

Thanks very much for this, Mark. If anyone wants to get in touch write to him at 71 Chantreaux Road, Lindeale, Leighton Buzzard, Bedfordshire LU7 1UP.

John Buckley of Liverpool has sent in a couple of useful tips for games without actually specifying which machine they run on. The choice is between Spectrum and Amstrad although I suspect that he actually has a Spectrum. Even so the tips may work for both machines.

"To see all of the rooms in *Cauldron*

two blocks that looks completely impossible to reach. To get to it go down to level three and go around until you find a room with three skulls in it. In between these you will find a jump pad. You must drop two objects on to the pad so that they fly up a floor. Then stand on it yourself and you will come to land on top of the two objects in the impossible brownie room.

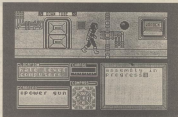
"A long room when you pick up the brownie and the two objects. Sometimes when walking off in a certain direction you will start to go all over the place and the only way to stop it is to reset the machine and load the program again.

"But I have found that you can stop this happening by getting the brownie before any other creature."

That's a timely tip for those of you who will be receiving your *Arcade Champion's Handbook* about now.

Paul Lynch, also of Liverpool and one M A Brown of Woking have both written with some plans for help with that other excellent Gargoyle game, *Maraport*. Again a complete map and helpful hints will be found in the *Arcade Champion's Handbook* but for now here are some solutions to your particular problems.

The reference to *The game* is the clue etc, in the games room means that the key you must find is something to do with



Maraport from Gargoyle Games

by Palace Software go into any underground room and then press the G key. You should then see a cursor appear on the bottom of the screen.

"Next type in any number from 0 to 90 to see all of the rooms. If you type 151 you will be in the Golden Brown room on top of the pumpkin. All you then have to do is jump right on to the broom to see the special message for those who have finished the game.

"You cannot get a top score in *Swaver's World* unless you approach things the correct way. On the second floor down there is a brownie on top of

games. Try collecting the stapler and the calculator (ie, the adder + multiplier) both of which you should have found by now and factor them.

This is a typical example of the dreadful game that permeates the wima game. Another is the use of boots to get into the chimney (great).

When you get to machinery take note of the message about 'things alive' - if you use this clue wisely you will find a connection between three objects that can be featured to give your game a boost.

**Tony Kendall**



# Tony Bridge's Adventure Corner



## Easy system

**O**ver the past few years, Adventure Corner has been host to many Quill'd games, most of them written for the Spectrum - I've seen one for the Commodore, and one for the Amstrad, which I shall be looking at in more detail as soon as I can resurrect my Amstrad!

The Amstrad has its own version of The Quill, but I have yet to see an adventure from this source (hereafter's QAC's, I think, rather more attractive to the service, and I'm sure that we'll see a lot more adventures from this source in the future, although the newer versions of Camel/CBL's Genesis may prove to be even better value.

Leslie Wright, who is also known as the House Elf, is the first reader to send me a QAC'd game; her adventure is called Sharpe's Deeds, and concerns your quest, as the heir to great-uncle Ferdinand Sharpe, to find the 12 treasures of his bequest and thus complete an unknown task.

I hope that Linda will forgive me making mention of her adventures here, as I believe that she has not started to market the game, and in fact has asked me for advice in this regard. Good adventures will always find a market, but to get your game widely known, I would advise you to approach a well-known adventure label. If they don't like your game, and you believe in it, then keep plugging away (but don't let any company keep your game for more than six weeks or so without a firm reply). If your adventure is better than the average, you will eventually get a release - and it is obviously better to let a professional

company handle all the necessary advertising and promotion, without which games just can't be sold in large numbers nowadays.

Linda makes some pertinent comments regarding QAC: "I have found QAC easy to use and flexible. I needed a system that was easy to understand - as far as the plotting on paper that Kevin Martin complained of (ACTV, Vol 5 No 2), surely that is a necessary requirement in producing any adventure (and part of the fun!). As for T Corby's criticism (Vol 5 No 4) that altering the map during play is impossible, it isn't, as I have done so in Sharpe's Deeds. It takes a little thought, of course: hidden rooms, new exits and so on have to be regarded as objects and brought in when the player has disposed of the obstacle. My main criticism of QAC arises from not being able to use as many locations with graphics as they claim - how would you be able to have 10000 rooms with graphics and still be able to play any worthwhile adventure? It would also be nice if you could have a title screen to watch while the program was loading. Little points I know: merely,

compatible with my 64bit the occasional strange hierarchy shows up, but fortunately, this doesn't detract too much from the general proceedings. The graphics are nicely drawn, and Linda has resisted the temptation to create very detailed, memory-consuming pictures, preferring rather to stick to simple line-drawings. These are, however, quite adequate - I can't wait, though, to see what authors might be able to do with disc storage, when they will be able to call in pictures as required from disc rather than Ram.

I'll return to QAC'd and QAC's adventures in a later date, as I still have several hiding in the lo trap, but for now, there's just space to mention a QAC program for the week. Many readers have asked me over the years "do you know of a good old QAC disk about?", and I have to say that there are not too many about, apart from the obvious Swords and Sorcery. The QAC has been particularly starved of such a program, but now Epic Adventures has come to the rescue with Demonic World Entrance to Hades, written by Clive Hedley.



Swords and Sorcery

I'm pleased that I brought QAC and plan to use it frequently."

Linda's program is an attractive game, although the plot is not wholly original: the problems that you'll find are nicely logical yet diverting. With plenty of well-illustrated locations to be explored, Sharpe's Deeds is a good introduction to adventuring to anyone who has just invested in an Amstrad. An interesting aspect of the game is that other characters in the scenario have to be spoken to and questioned; only by doing this will you come into possession of items necessary to your further progress in the adventure. The adventure was written on Linda's CPC464, and isn't, therefore, 100%

compatible with my 64bit the occasional strange hierarchy shows up, but fortunately, this doesn't detract too much from the general proceedings. The graphics are nicely drawn, and Linda has resisted the temptation to create very detailed, memory-consuming pictures, preferring rather to stick to simple line-drawings. These are, however, quite adequate - I can't wait, though, to see what authors might be able to do with disc storage, when they will be able to call in pictures as required from disc rather than Ram.

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This Monster and Dragonman Creator is disc-based, and extraordinarily colourful. It's also very fast, boasting many very jolly tunes (and they get jolly irritating, too, as these things do after a while!). The manual that arrived with the program seems to let a pre-production copy - I hope so, as the general tone is understandably and really unhappy, not rising far above the level of "Switch on the black-typed object called a computer".

If you can resist the temptation to throw up, then you're in for a treat.

Several modules allow, first of all, for the creation of characters (Figures, Lord, Cleric, Ninja and so on), weapons, weapons (swords, daggers, maces, and spells (Mantras of Magic, Inventory etc), and then on to setting up the map for the adventure, which, as you can guess by now, is mostly combat-orientated. A maximum of 200 rooms can be set up, with 124 objects. These objects include 30 "portable" items, potions, monsters and so on. A list of recognised words is then drawn up. Set up is accomplished by several very attractive and easy-to-use menus and situations can be made at any time.

The final adventure is a must for any Bash 'n' Bash devotee; as just it, it's surely the best value around for the Bash D&DPC: Epic Adventures, PC Box 850, Esher, Surrey.

## Adventure Helpline

Being harassed? If you are stuck in an adventure with nowhere to turn do not despair - keep us informed!

Put in the request, supplying your problem, send it to us, and a fellow adventure may be able to help.

Remember - the system only works if those adventures who have asked the public get through. Every user is free to adventure! (Only QAC'd ones!)

Submitting:  (a.k.a.)  
Problem:   
Name:   
Address:



# Peek & Poke



## Off the screen

Simon Jay, of Solihull, writes:

**Q** Can you explain why, when using Pokes 1234 & 5678, if in a program for moving a character on the screen, the program stops working if the character goes off the screen.

**A** Firstly you have to think about what it is you are actually doing.

You are poking the screen display file with data. If your character has disappeared off the screen then you must be poking somewhere outside the screen display area, and thereby corrupting another part of Ram, say, the program or variables area.

Try doing a few runs with values of 1 and 2 that take you

outside the screen and see what part of memory you would be poking.

## Spectrum keyboard

D M Williams, of Liverpool, writes:

**Q** Readers of Popular may be interested to know that Spectrum membranes can be purchased for around £5. They are easy to install and are available from various retailers. In case people cannot find one in their area, I can provide two addresses: EE Computers, Dale Street, Liverpool and, The Micro Workshop, 12 Station Approach, Ipswich, Surrey.

**A** It is good to hear that the old Spectrum keyboard membranes are still available at a reasonable price. I wonder if the same is true for other 'rubber only' components?

## Power supply

Marcel Palmer, of Devon, Switzerland, writes:

**Q** I own a Sinclair QL and I've the following

problems: very often the cursor on the screen stops flashing and I have to reset the QL. This also happens when I work with Pokes programs. All things which were typed in are lost. Perhaps I have a problem with the power supply, as on the continent I work with 230 volts.

**A** My guess is that your problem is either caused by: a) a faulty QL ... I suggest that you get this checked out by a dealer if you can, or, b) a 'dodgy' power supply. If the supply fluctuates greatly this could cause Ram contents to be lost, even if only partially. There is not much I can suggest here, except that you could investigate the possibility of running your QL via some sort of battery.

## Musical notation

Yanki Paucha from London writes:

**Q** I would like to play classical music on my Amstrad 128, but I don't know much about musical notation. Is there any way I can convert music from my cassette recorder into my computer, then by analysing the input, determine the

music being played?

**A** There's no single answer to your question, but some options that might suit your requirements. You could look at a music package like Reinhard's Music Spaces - this will allow you to compose music on the three channels of the Amstrad's sound chip in conventional music notation. Although you say you are not familiar with musical notation, you wouldn't find it too difficult to get hold of some music and enter it into the program. You could then listen to it and analyse it bit by bit.

You do have a problem when you specify 'classical' music as your interest with only three channels (three single voice instruments if you like). Most classical music is far too complex to replicate, although you might manage some simple Bach. My advice would be to seek out those special music score books which are designed for Casses, Yamahas, and other keyboards with 'easy play' facilities. Here the music is simplified such that you might be able to squeeze it into your machine.

As another answer to your question, it is theoretically possible to convert sound into digital information on your Amstrad.

# The Rogue Program



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The wreckage shows like glowing bones-stones in the alien's glow.



The two figures appeared about transparent of form.

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# Charts

## Amstrad

1	(2)	Snake	(Oxford)	25.0
2	(3)	Star Wars 2	(Spectrum)	23.0
3	(1)	Tut Cal	(CML)	22.0
4	(5)	Ty To King Pa	(Imagines)	20.0
5	(4)	Formula One Simulator	(Mastertronic)	17.0
6	(12)	Spider 80	(Microline)	16.0
7	(10)	One Man and his Droid	(Mastertronic)	15.0
8	(7)	Sky Fox	(Lectroline)	14.0
9	(8)	Video Snipers	(Microline)	13.0
10	(11)	Black Spot	(Spectrum)	12.0

## Atari

1	(2)	One Man and his Droid	(Mastertronic)	17.0
2	(3)	Action Man	(Mastertronic)	17.0
3	(5)	Lighter Bolt	(Digital Imagination)	15.0
4	(1)	Chariot	(Spectrum)	15.0
5	(11)	Chariot	(Penguin)	15.0
6	(7)	Sky Fox 2	(Spectrum)	14.0
7	(10)	Black Spot	(Spectrum)	13.0
8	(9)	Baron's Revenge	(CML)	12.0
9	(8)	Sky Hawk	(US Gold)	12.0
10	(12)	Golden	(US Gold)	11.0

## BBC

1	(2)	Ty To King Pa	(Imagines)	25.0
2	(1)	Snake	(Oxford)	24.0
3	(5)	Star Wars Battle	(Spectrum)	23.0
4	(3)	Golden	(Spectrum)	22.0
5	(12)	Formula One	(Spectrum/CML)	20.0
6	(11)	Formula One	(Spectrum)	19.0
7	(10)	HyperSports	(Imagines)	19.0
8	(9)	Lord of the Rings	(Melbourne House)	19.0
9	(7)	Star Wars	(Penguin)	17.0
10	(13)	Way of the Exploding Fist	(Melbourne House)	15.0

## Commodore 64

1	(1)	Oridian	(Browns)	25.0
2	(2)	Handball	(US Gold)	23.0
3	(3)	Ty To King Pa	(Imagines)	20.0
4	(5)	Dragon's Lair	(US Gold)	19.0
5	(4)	Video Ods	(Imagines)	19.0
6	(12)	Golden	(Spectrum)	19.0
7	(11)	Golden	(Spectrum)	17.0
8	(10)	Golden	(Spectrum)	16.0
9	(9)	Snake	(Oxford)	15.0
10	(13)	Lord of the Rings	(Melbourne House)	15.0

## Spectrum

1	(5)	PA Cup Football	(Virgin)	25.0
2	(2)	Movie	(Imagines)	23.0
3	(1)	Sky Fox	(Lectroline)	20.0
4	(11)	Barry McGuigan World Championship Boxing	(Activision)	17.0
5	(12)	Formula One/Simulator	(Mastertronic)	15.0
6	(10)	HyperSports	(Imagines)	15.0
7	(9)	Waters Games	(Eggs/US Gold)	15.0
8	(13)	Spellbound	(Microline)	13.0
9	(14)	Video	(Penguin)	12.0
10	(8)	Commando	(BBC)	11.0

## Top Twenty

1	(1)	Oridian	(CML)	Browns
2	(2)	Ty To King Pa	(Various)	Imagines
3	(14)	Commando	(Spectrum/CML)	Elite
4	(3)	Handball	(CML)	US Gold
5	(11)	PA Cup Football	(Spectrum/CML/Amstrad)	Virgin
6	(4)	Rambo	(Spectrum/CML/Amstrad)	Ocean
7	(7)	Sky Fox	(Spectrum/CML/Amstrad)	Activision
8	(12)	Formula One Simulator	(Various)	Mastertronic
9	(6)	One Man and his Droid	(Various)	Mastertronic
10	(9)	HyperSports	(Various)	Imagines
11	(8)	Movie	(Spectrum)	Imagines
12	(11)	Action Man	(Spectrum/CML/CML/Atari)	Mastertronic
13	(13)	Steve Davis Snooker	(Various)	CML
14	(10)	Barry McGuigan World Championship Boxing	(Various)	Activision
15	(15)	Big Mac	(CML/CML)	Mastertronic
16	(17)	Lord of the Rings	(Spectrum/CML/Amstrad/BBC)	Melbourne House
17	(12)	Formula One/Simulator	(Various)	Mastertronic
18	(16)	Waters Games	(Spectrum/CML/Amstrad)	Eggs/US Gold
19	(17)	Elite	(Spectrum/CML/Amstrad/BBC)	Firebird/Activision
20	(18)	Way of the Exploding Fist	(Various)	Melbourne House

Figures compiled by Gallup/Microscope

## Readers' Chart No 66

1	(2)	Elite	(Spectrum/CML/Amstrad/BBC)	Activision/Firebird
2	(3)	Commando	(Spectrum/CML/CML)	Elite
3	(1)	Ty To King Pa	(Spectrum/CML/Amstrad/BBC/MSX)	Imagines
4	(10)	Movie	(Spectrum)	Imagines
5	(11)	Lord of the Rings	(Spectrum/CML/Amstrad)	Melbourne House
6	(9)	Waters Games	(Spectrum/CML/Amstrad)	Eggs/US Gold
7	(12)	Swords and Sorcery	(Spectrum/Amstrad)	PBI
8	(13)	Spellbound	(Spectrum)	Mastertronic
9	(14)	Spitfire 20	(Spectrum/CML/Amstrad)	Microline
10	(8)	Rambo	(Spectrum/CML/Amstrad)	Ocean

Winning Phrase No 66: "Excellent chart from Game!" from P & B Studio, of London, SW14, who wins £25. An honorable mention goes to Michael Knight, of Birmingham, who "US Commando goes, Star Wars!"

## Now voting on week 68 - £25 to win

Each week Popular is compiling its own special software top ten chart - compiled by YOU.

And each week we will send £25 to the person who sends in, with their chart votes, the most original (witty, neat or clever - but never rude) phrase or sentence made up from the letters (you don't have to use them all) in the titles of the top three programs in this week's Readers' Chart, published above.

You can still vote in the chart without making up a slogan - but you won't be in with a chance of winning the prize.

All you have to do is fill in the form below (or copy it out if you don't want to damage your magazine) and send it off in: Top 10, Popular Computing Weekly, 12-13 Little Newport Street, London WC2N 1PP.

Voting for Week 68 closes at 5pm on Wednesday March 14, 1985. Entries received after that time will not be eligible for inclusion in that week's voting. The judges' decision is final. Only one entry per individual per week will be allowed.

Name .....	My top 3 Voting Week 68
Address .....	1 .....
	2 .....
	3 .....
My phrase is: .....	

# New Releases

## ENTERTAINING

All things considered, there are very few games programs based around the idea of looking into computers. *Atlantis's* *Atlantis* seemed like it was, but wasn't really. Offhand, *Spectrum 1280* is the only example I can think of.

Room then for *SuperCom* for the Spectrum, a neat little program that has the additional advantage of being cheap at £1.99. It isn't terribly sophisticated, but it's surprisingly entertaining. The plot involves using your computer to find your way through to a computer controlled by the great criminal mastermind, who is holding the country in ransom with the usual nuclear warhead.

The path through to the main computer is via dozens of numbers and codes which must be discovered through a mixture of deduction and trial and error.

Beginning with a half com-

pleted number, you use a link analysis device on each new telephone line to give you bits of information about numbers and codes. When you ring a number, the Spectrum makes a reasonably fair impersonation of phone bleeps and blips and if the number is correct, you are presented with a screen full of information that may contain more clues and more numbers.

It's not astounding - the screen displays are very basic-looking and the instructions don't tell you what things like the *I* key is used to return to the main menu. Nevertheless, I think you'll be hooked.

### Program SuperCom

Price £1.99

Misc. Spectrum

Supplier Atlantis Software  
18 Princes Street  
London W1 8PP

## UNUSUAL

*Atlantis's* *I* is a rather unusual entry to the Spectrum, that is more than a conventional action type program and yet not a complete games designer. It is best thought of as a package to help with all the graphs to display elements of game design.

The program is designed around a series of separate screens each called by a *Cop*-defined key press. The most straightforward of these is *Design* which gives you information, variable cursor speed, colour, etc.

Line mode and Circle mode are subsets of this option, letting you draw basic outlines of shapes in the usual

Pick of the week

way. Print mode lets you shoot a line or text around and includes facilities to compress and alter the spacing between letters.

The Screen Pack contains a variety of options to manipulate the entire screen, distorting the bit image and/or attributes around by either pixel or single character.

There's no denying it, there is a disturbing trend for the production of instantly flabby programs. The path graphics and sound? The glossy ads - it looks fairly in the shop - but when you get it home and load it up, it plays like a pig. Oh, that more games were like *Thrust*.

Programmed reputedly by a physicist (who does most these rumours?), its basic vector graphics make it look like an updated version of *Lunar Lander* or *Granular* and the sound during the action is, well, minimal. So what makes it the best release of its kind this year?

The scenario is straightforward enough... you have a ship (under constant gravity - downwards...) with a limited amount of fuel. You must manoeuvre through minefields (reminiscent of picking up some fuel - supplying/avoiding gun emplacement) to collect a heavy ball, which attaches to your ship via a rigid, but

Key to the program is the *Sprite* menu, which allows you to store sprite designs in memory, retrieve them and animate sprites by moving through a series of drawings as speed.

When does it all add up to? I'm not sure really. Certainly everything functions well and with a small amount of me-

## ESSENTIAL BUY

growing red... this is the clever bit. The ball is much heavier than your ship, but swings free - does anyone remember *momentum*? Naturally, if you or the ball collide with the tunnel sides, you're dead. All you have to do then is get to the surface (you're not running out of fuel, are you?), blast the reactor (what reactor?) and you have ten seconds to reach the top of the atmosphere.

Maybe it's the playability, maybe it's the responsiveness of the controls (keyboard only... this is the snail) or maybe it's because it is so difficult. Whatever it is, at £1.99, it can be regarded as the essential purchase for the hardcore gamer/player this year.

### Program Thrust

Price £1.99

Misc. C64/80

Supplier Phoenix Software  
Wellington House  
Upper St Martin's Lane  
London WC2H 9BH

Key to the program is the *Sprite* menu, which allows you to store sprite designs in memory, retrieve them and animate sprites by moving through a series of drawings as speed.

When does it all add up to? I'm not sure really. Certainly everything functions well and with a small amount of me-



# This Week

Program	Type	Store	Price	Supplier	Available	Store	Price	Supplier
Batman	Act	Atlantis	£8.95	Orson	Available	Commodore 64	£1.99	Mastertronic
Powerline	Act	Atlantis	£8.95	Archie	Available	Commodore 64	£1.99	Mastertronic
Scavenger of the C6	Act	Atlantis	£2.99	Atlantis	Available	Atari	£7.95	Amco
Way of the Tiger	Act	Atlantis	£8.95	Combin/Graphix	Available	Commodore 64	£3.95	Malvern House
Killer	Act	Atlantis	£7.95	Archie	Available	Atari	£7.95	Malvern House
Malvern House	Act	Atlantis	£14.95	Malvern House	Available	Atari	£7.95	Amco
Stone Gods Shocker	Act	Atlantis	£8.95	Orson	Available	Spectrum	£2.95	Amco
Project Thrust	Act	Atlantis	£8.95	Orson	Available	Spectrum	£2.95	Amco
Brain Plus	Act	Orson	£4.95	Orson	Available	Spectrum	£2.95	Amco
Powerline Plus	Act	Orson	£4.95	Orson	Available	Spectrum	£2.95	Amco
Maxim	Act	Orson	£4.95	Orson	Available	Spectrum	£2.95	Amco
Bingo	Act	C64/Plus 4	£5.95	Amco	Available	Spectrum	£4.95	Amco
Winter Events	Act	C64/Plus 4	£5.95	Amco	Available	Spectrum	£4.95	Amco
Pink	Act	Commodore 16	£2.95	Atlantis	Available	Spectrum	£4.95	Amco

## New Releases

chine code knowledge you can use the sprites in your own programs. But I'm not sure that there are many people for whom this will be the right program. You can think of it as a highly powered sprite designer, but then it needs more to help you fully integrate those sprites into your own programs—there is only sketchy information about how to do this in an otherwise reasonable manual.

That £14.95 price tag puts it up against the likes of Art Studio from Rainbird and there is no contest on that level.

**Program:** Animator I  
**Price:** £14.95  
**Micro:** Spectrum  
**Supplier:** Schor  
PO Box 39  
Macclesfield  
Cheshire

### BIZARRE

Much as it amazes me to say this, the most intense and intense of games called, amongst other things, *Panic*, in the arcade, has now turned up on the QL (where all the old arcade games put their prices go to rest). For *Quboids* is such a well implemented version of the game at such a reasonable price I find myself kindly disposed towards it.

*Panic* (so whatever the version you played was called) replaces in one of the most intense plots ever to be found in an arcade game (I have a feeling that someone mis-translated Japanese intro-



duce somewhere along the line). You wear a space suit and must keep your air replenished by collecting air bottles and eat food that is lying about. Kill enemies by digging holes into which they fall and then bomb them with a pneumatic hammer. Points depend on how quickly you clear the screen and how far the monsters fall.

The QL version features large smooth sprites and some amazingly good sound effects. I began playing it, sneering heavily, and in the end had to be hastily dragged back to my desk. Drilling the late western heads was, I think, the closest this did to — the surprise on their faces! Odd to the point of seeing the game idea may be, but *QL Quboids* is a fine program for all that.

**Program:** QL Quboids  
**Price:** £9.95  
**Micro:** QL  
**Supplier:** Sinclair Research  
Milton Rd  
Milton  
Cambridge

### GOOD CHOICE

In these days of game creators, a sprite and font package seems a curiously undervalued affair, yet the Angelfoot Sprite Designer and Font Converter has some things to recommend it.

For one thing the package is very nicely designed, using icons and windows style displays, for another it has a very large range of features including, as part of the Sprite Designer, an animated feature in which a sequence of ten frames may be constructed using any of the sprite shapes in any order.

Sprites may be single or multi colour, although the grid use to construct the shapes, pixel, obviously loses half its horizontal resolution in the latter case. Other features include expanded size sprites, mirror and flipped images.

The font generator works in a similar way to the sprite designer and also offers multi colour and mirror/flip effects. Both fonts and sprites can be easily incorporated into your own programs.

I'm still not sure that there is really much need for packages such as this any more. Simpler versions appear almost every month amongst the readers programs in the magazine and game creators do a more complete job. Nevertheless, if you want a sprite designer this is a good choice.

**Program:** Sprite Designer & Font Converter  
**Price:** £9.00

**Micro:**  
**Supplier:**

**Commodore 64**  
**Angelfoot**  
PO Box 80  
Carmarthen  
CV1 8SL

### UTILITY

*M Drive Doctor* is a computer hardware utility that gives the Spectrum the kinds of sector analysis and the repair features associated with disc drives and Talent's microdrive doctor for the QL.

Though Spectrum microdrives seem to be pretty reliable these days, there are still a number of occasions where, for one reason or another, files get corrupted and impossible to load. *M Drive Doctor* allows you to examine files sector by sector and then dump each one to a screen (whether corrupted or not) where each byte can be corrected by hand using a real master system.

The other features of the program give it CP/M like disc handling features.

All the new file features are accessed via new additions to the Basic command set. Though you would probably need to be fairly technically sophisticated to get the most from the program, for those making constant use of microdrives for data storage it represents a useful utility.

**Program:** M Drive Doctor  
**Price:** £3.50  
**Micro:** Spectrum  
**Supplier:** Apud Systems  
181 Millerside  
Dunfermline  
Fife KY12 8NN

## This Week



## Too little, too late

**A** person who has used many recent computing magazines will know that the current of the fiction stories to involve **PC** compatibility. We're told that **Amstrad** will soon market a cheap **PC**-compatible **Amstrad** is criticised for launching an **MS-DOS** machine that isn't really so called a compatible. Other manufacturers have already launched their clones, and the price is gradually edging down towards the average home user.

All the signs seem to point towards a generation of machines far more cheaper **PC** clones, using the latest chips and CPUs to duplicate the main features for a fraction of the **PC**'s price. And as they become cheaper, so they will be bought more by home users, either seeking compatibility with office machines, or for their intimate work.

The snag is that the generation of machines will probably only on yesterday's software designs; the best and most innovative programs are already working on programs for the **Amstrad** and **Commodore** range.

For business applications this isn't necessarily too important. The main problem here is likely to be the sheer price of programs. It doesn't seem likely that potential home users will be interested in a fully-featured word processing package that costs more than their computer. The first pricing marks have appeared: some programs costing £80 to £100 offer all the features seen in equivalents costing less or five times as much. Even at the current low prices would seem overpriced to most British home users, and it's likely that the introduction of cheap home machines will lead to massive price cuts.

Where **PC**-compatible software really lags is in the games field. Little or no innovative design seems to be undertaken, almost everything released for **PC**-compatible is a conversion from **Amstrad** machines. A current list opens £80 for *The Robot*, *Ein Welter* Program, and even £90 for a flight simulator. At least one

of these three is much older than its **Spectrum** equivalent. The existence of games seems there is an interest. And as soon as you have home users, you have game players.

The **PC**'s minimum specification is better than most home users, with the sole exception of graphics capability, where the **PC** design dates its age. The most common **MS-DOS** standard (set in 16 colours, graphics resolution 320 x 200 in 4 colours, or 640 x 350 in one colour) will probably be used in the new machines, in suitable software compatibility, but most will probably also include much better (but non-standardised) high-resolution colour modes. Unless a new standard is agreed the current **MS-DOS** mode will continue to dominate, often most programmers won't want to rewrite their programs for a dozen different screen designs.

In the past British designers have shown a tendency to apply their ingenuity to every new machine, and some of the amazing programs written for **Amstrad**'s **48** **Vice** and **MS-DOS** for examples of how ingenuity has triumphed over the limits of hardware and common sense. It seems odd that there aren't more British programmers planning to push the limits of **PC**-compatibility.

Knee without any innovative programming, and even before the anticipated flood of **PC**-compatibles appears, the huge loss of first games produced in the UK could probably be transferred to **PC**-compatible formats said at twice their original price they'd still seem like bargains to the average **PC** user. Although there are already conversion problems, several software houses have already developed programs which make the transition relatively painless. Higher-level compiled languages (such as **Basic**, **C**, and **Pascal**) are readily convertible, guaranteed the programmer is prepared to develop an appropriate library of routines for graphics and sound.

As an example of what might be possible, the most popular game for **MS-DOS** and compatible is still Microsoft's *Flight Simulator*. It's held its place in the charts for at least two years. Other popular **PC**-game include several business simulations. It seems odd to me that **Amstrad** don't seem to have even considered converting *Elite* to the **PC**.

It seems certain that we'll have a lot of **PC**-compatibles in the home within the next six to 18 months. If British software houses don't start thinking about this opportunity soon, they'll be dismissed not by our medical Associates (because, as find that their programs will be too little and too late.

Maureen S. Rowland

## Puzzle No 160

Can you solve 'Popular Computing Weekly'? Yes, if you use the initial letters, 'P', 'C', and 'W'.

Take these three letters and substitute a digit for each, remembering that each different letter must represent a different digit. The number so obtained can then be cubed.

In the following three examples (each, of course, involving a different substitution), the resulting number contains one of the original three digits in all but one of its digits.

Here are the three examples, in each case the 'P' represents the odd digit out

**PCW** x **PCW** x **PCW** = **PPPPPCWW**  
**PCW** x **PCW** x **PCW** = **PPCCCCC**  
**PCW** x **PCW** x **PCW** = **PPPPPCWWWW**

Can you discover each value?

## Solution to Puzzle 160

The multiplication was **2377** x **481** = **1143397**

As the product contains all the identical digits, it must be a multiple of 111111. To be more specific, it must be of the form **T111111**, where **T** is a number from 1 to 9.

The program works by using two *For*-*Next* loops, one to hold the value **T**, and the other to hold the three-digit multiplier. This is in the range of 120 to 980. Each of the nine possible products are worked out in sequence, and the value is divided by **T**. A result that is a multiple of 111111, and in the range 1200 to 9870 is a possible solution. However, as all of the digits are different, the seven relevant digits are put into a string variable (**S**) and are tested for duplication of digits.

In the event of no digit being duplicated, the results are printed out, this reveals seven possible sets of figures, but the question stated that if you know the value of the third digit of the four-digit number you could find the answer. Only if this was a '7' could a unique answer be found as all other values will provide more than one answer.

## Winners of Puzzle No 159

The winners in **P. J. Gaylor** of Glasgow, who will soon be receiving the princely sum of £15.

## Notes

The closing date for puzzle 200 is April 15.

## THIS WEEK

Program	Type	Price	Supplier	Isabelle Shilling	Am	Commodore 64	£1.99	Makermatic
Salmon	Am	Amstrad	£8.95	Ocean	Am	Commodore 64	£1.99	Makermatic
Panorama	Am	Amstrad	£3.95	Anticraft	Am	Commodore 64	£1.99	Amstrad
Survivors of the OE	Am	Amstrad	£3.95	Atlantic	Am	Commodore 64	£1.99	Amstrad
Way of the Tiger	Am	Amstrad	£9.95	Graphic Graphics	Am	Electric	£9.95	Maitour House
Kaiser	£	Amstrad	£7.95	Anticraft	Am	Electric	£7.95	Amstrad
Maitour House	£	Amstrad	£14.95	Maitour House	Am	Spectrum	£2.95	Atlantic
Shave Davis Snooker	£	Amstrad	£9.95	CEC	Am	Spectrum	£9.95	Amstrad
Project Thesis	Ad	Atari	£9.95	Polica	Am	Spectrum	£7.95	Ocean
Brown Plus	£	MSX	£8.95	Charm	Am	Spectrum	£1.99	Atlantic
Football Plus	£	MSX	£2.95	Charm	Am	Spectrum	£9.95	Graphic Graphics
Murder	£	MSX	£9.95	Charm	£	Spectrum	£9.95	Maitour House
Bongo	Am	Commodore 64	£9.95	Amstrad	£	Spectrum	£4.95	Amstrad
Water-Trends	Am	Commodore 64	£9.95	Amstrad	£	Strategy-simulation		
Patch	Am	Commodore 16	£2.95	Atlantic	Am - arcade	£ - Utility		£4 - education

# Spindizzy

A  
3-D  
GAME  
OF  
SKILL

BY PAUL SHIRLEY



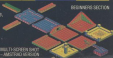
*Electric  
Dreams*

SOFTWARE

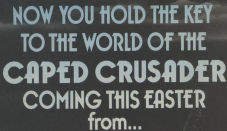
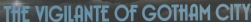
Available on the 48K Spectrum, Amstrad  
and Commodore 64 from Electric Dreams Software,  
31 Canby Crescent, Southampton.  
Telephone: (0703) 229684.

\*Spindizzy is quite simply one of THE most impressive games  
on AMF home micro! MGS441, 88% - JMS'87

\*Spindizzy combines marvellous graphics, testing puzzles  
and a large area to create a stunningly original and  
challenging game! AA PAFMAG, 26% - MAG 1743 AC'87



MULTI-SCREEN GAME  
- MAG 1743 AC'87



7.95

AMSTRAD

8.95

Oracle Software is available from selected branches of  WIPRO LTD.  IBM CORPORATION, UNITED STATES, HAMBURG, GERMANY



